

- 17 -

**ABSTRACT OF THE DISCLOSURE**

A method of performing digital beam forming on the radiation pattern of an array antenna using a plurality of antenna elements, each antenna element being coupled to a signal processing chain. A weighting phase is used in which at least a complex weight coefficient is applied to a digital signal in a corresponding signal processing chain. The digital signal is an intermediate frequency digital signal, and the weighting phase has the following steps: a) duplicating the digital signal into a first and a second digital signal; b) processing the first and second digital signals by multiplying the first and second digital signals respectively by a real and an imaginary part of the complex weight coefficient; applying a Hilbert transform to that signal which is multiplied by the imaginary part of the complex weight coefficient; and c) combining the processed first and second digital signals into a weighted digital intermediate frequency signal by subtracting the second signal from the first signal.